

News from CERN/LHC++

- Class Libraries
 - CLHEP, Tools.h++, STL, ObjectSpace
- Platforms
 - Linux, NT
- Future of “CERNLIB”
 - Maintenance, NAG
- LHC++
 - Iris Explorer, histOO, Objectivity

Class Libraries

- Tools.h++ (RogueWave)
 - t officially supported any more**
 - se Standard C++ Library instead**
- Geant4 will/tries to switch to STL ...
 - They will have a hard time for the 98 releases supported on more platform than STL
 - almost all features can be replaced with sometimes very tricky STL code (delete-, sort-iterators, adapters) e.g.
`rAndDestroy(), RWTPtrSortedVector`
 - DD: pragmatic - use for transient classes if it makes life easier

Class Libraries

- Standard C++ Library (STL + more)
 - seen as THE future standard at CERN
 - problem: implementations vary considerably (STL \neq STL)
 - very powerful, but often very cryptic
 - use one implementation only: ObjectSpace
- ObjectSpace
 - Objectivity implemented *persistent* version of ObjectSpace
 - \Rightarrow use also for transient version
 - problems on LINUX
 - CERN wide license: \$40,000
 - possible conflicts if compiler comes with Std. Library

Class Libraries

Math.h++ (RogueWave)

- not good enough
- best part is the random engine/generator part (adapted in CLHEP)

CLHEP

- nobody likes it (JS: political decision)
- ‘everybody’ agrees that it is NOT the best solution/implementation
- DD: global constants ‘m, g, s’ **must** go (hard for G4!, sed on m?)
- DD: abs, max, min **must** go (conflict with STL)
- JS: next release without String, Alist (use STL instead)
- JS/DD: CLHEP needs to be changed, open for improvements
written in the context of STAR
(i.e. templated ThreeVector, LorentzVector)
- JS: **asks STAR to join LHC++ video May 11 to discuss issues**

Platforms

- CERN seems to focus on the following platforms:
 - HP-UX 10.20, Solaris 2.5.1, AIX/6000 4.15, IRIX 6.4, NT
 - NT pushed a lot
 - only one compiler/platform and one OS/platform
 - (see also CCN 229 and
<http://wwwinfo.cern.ch/asd/lhc++/platforms.html>)
- Linux not welcome?
 - not support by many commercial products/vendors (NAG, ObjectSpace)
 - needs a lot of support contrary to CERN politics to use more and more commercial solutions
 - ATLAS shows increasing interest in Linux
 - ⇒ might become an issue

Future of ‘CERNLIB’

- **CERNLIB**
 - frozen but not abandoned until 2003
 - current effort \approx 2h/week
 - mathlib not supported anymore
 - JS: software decay (“*STAR should be aware of this*”)
- **Replacement**
 - CLHEP
- NAG: covers all functionality of mathlib except for 12 special functions
 - JS: ongoing negotiations with NAG to turn current NAG mathlib into class library

Future of “CERNLIB”

- **HBOOK**

to be replaced by persistent/transient **histOO**

histOO currently rewritten (incorporate new ideas)

DD: Root \Leftrightarrow histOO comparison a fake

change 1 statement: 2 x faster than reported

ebug off/ opt on: 4 x faster than reported

DD admit that still slower than old **HBOOK**

DD: advantage if many and large histos

can be naturally packed into classes etc.

Future of ‘‘CERNLIB’’

- Histograms

PAW replaced by **HepExplorer** (LHC++ Project)

- Composed of several packages:

- » **IRIS Explorer** (v3.9)(NAG)
- » **Open Inventor** (v2.4)
- » **OpenGL** (v1.0)
- » **Objectivity** (v4.0)
- » **ObjectSpace** (v2.0)

Preliminary release available from CERN
requires several licenses
rudimentary functionality (currently)

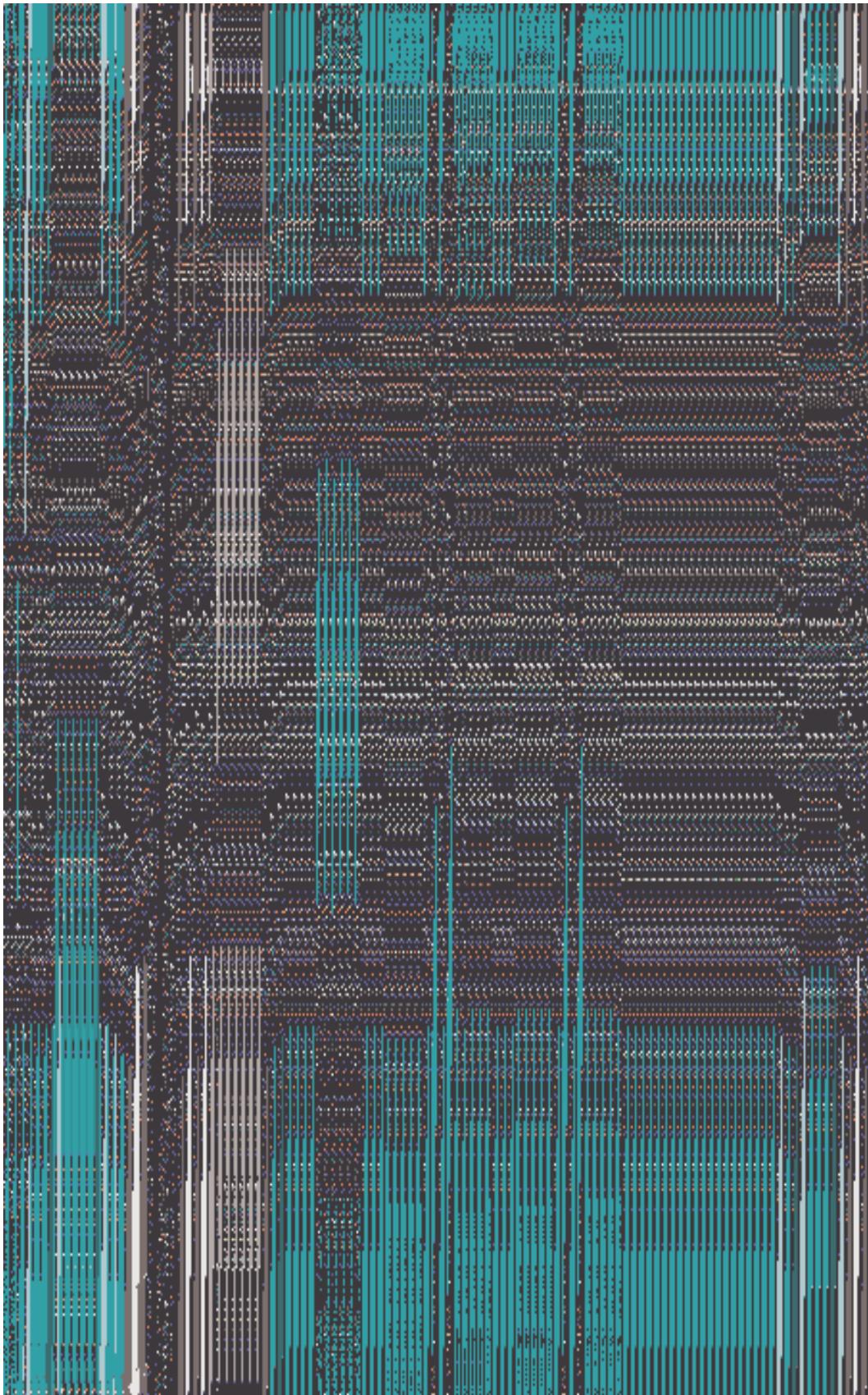
Licensing Costs

Component	Maintenance	Comments
RW Tools.h++	3.6 kCHF	
NAG C library	14 kCHF	Annual charge
NAG Fortran library	26 kCHF	
Graphics Bundle	35 kCHF	OpenGL on HP/Sun, vendor OpenGL elsewhere, OpenInventor, Master Suite.
IRIS Explorer	14.5 kCHF	
Objectivity/DB	42 kCHF	Existing Licenses

LHC++ 1998 Supported Platforms

Platform	OS	Compiler
HP	HP-UX 10.20	aCC A.1.06
IBM	AIX 4.2	X1C 3.1
SGI	IRIX 6.4	C++7.1
DEC	Digital Unix 4.0	C++ 5.5
SUN	Solaris 2.5	SunPro 4.1
NT	4.0	MVC++5.0

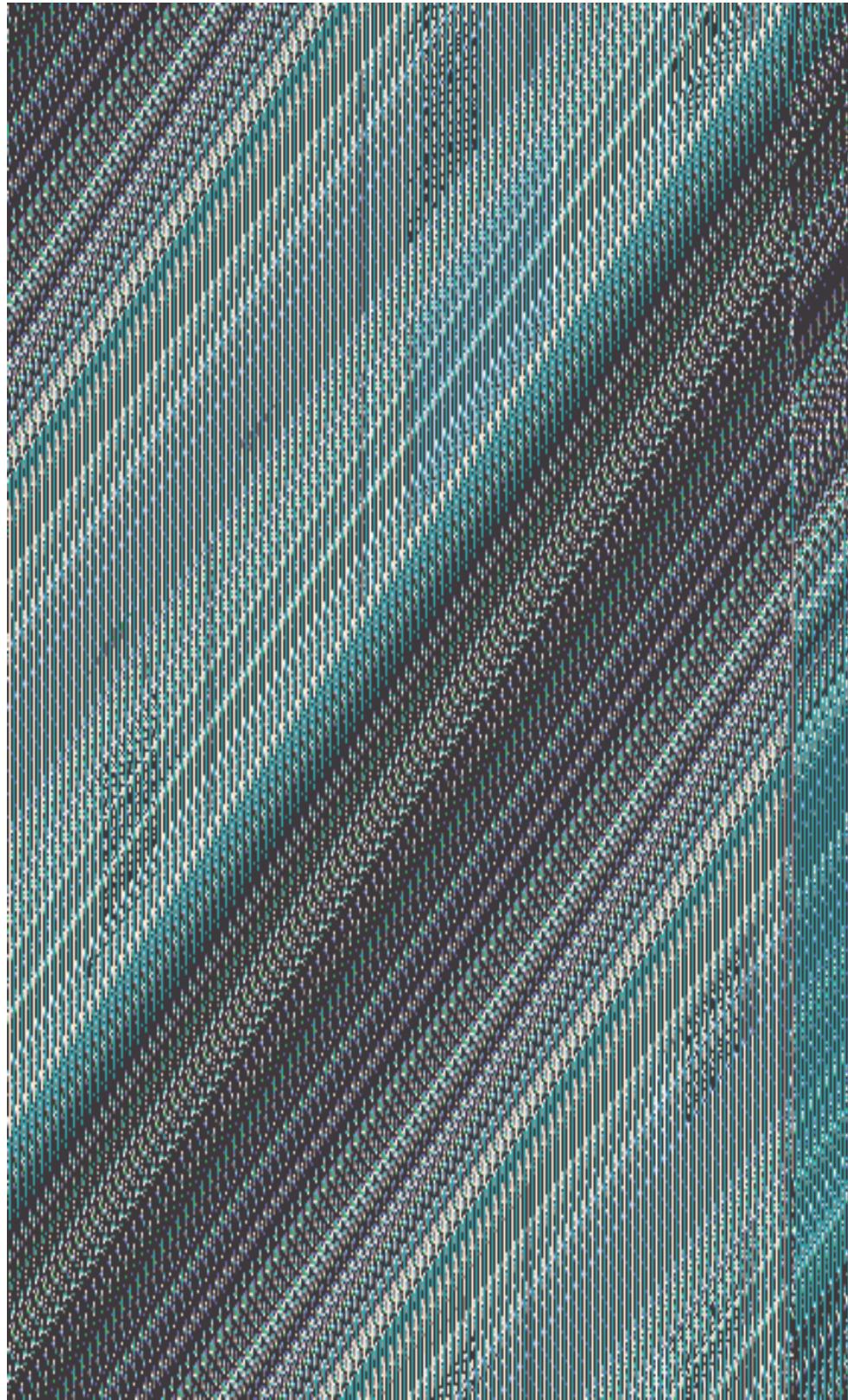
HepExplorer



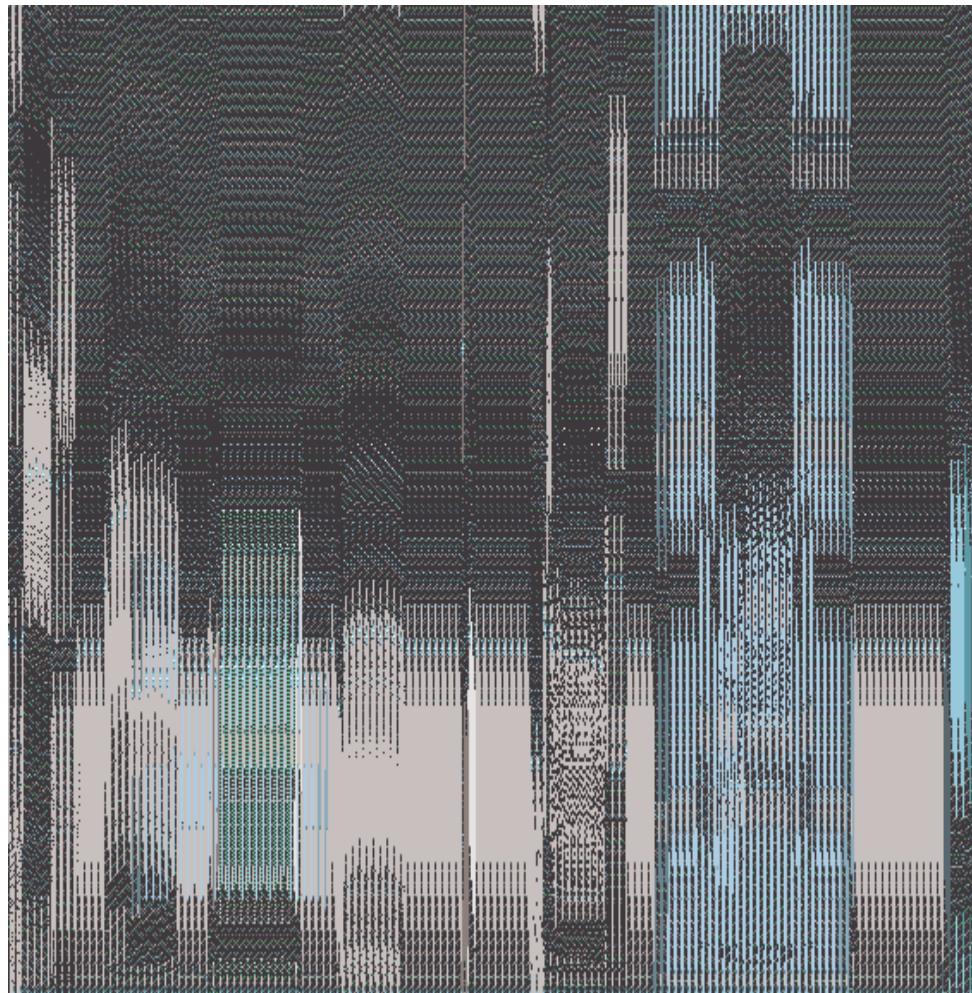
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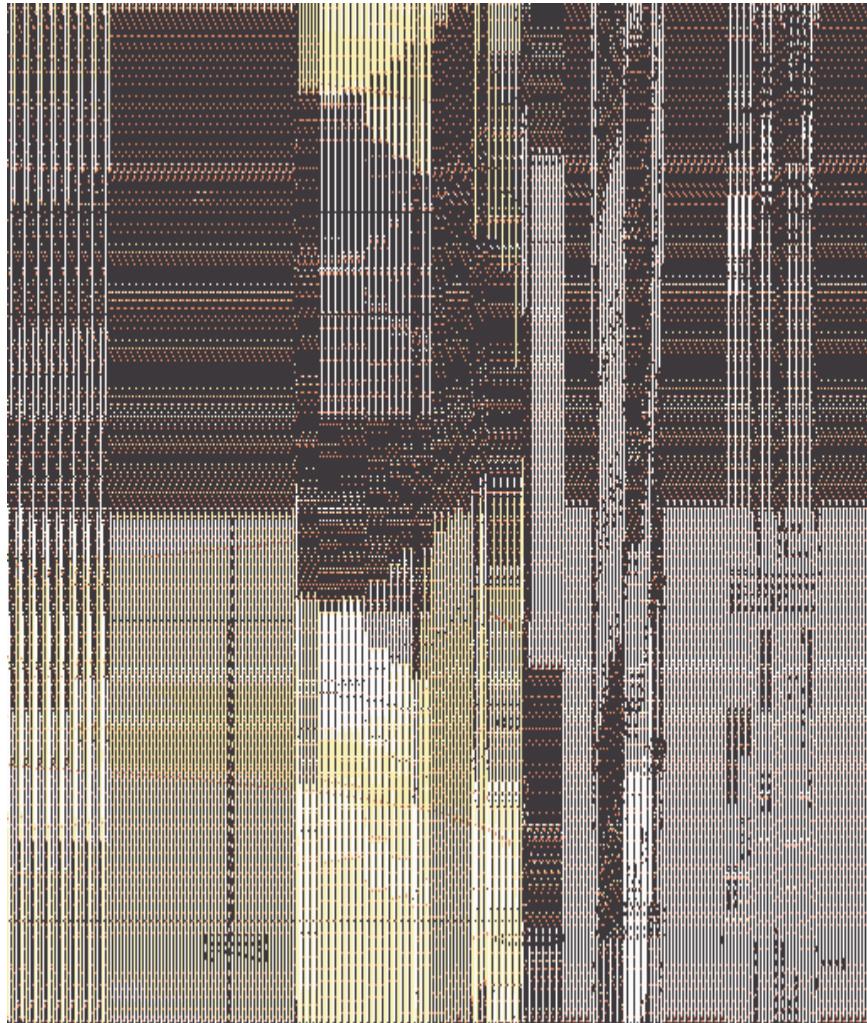
Histogramming Module



Fitting a Histogram



A Histogram



LHC++

- **Objectivity**

include BaBar calibration DB

waiting for Objy5

- HP: aCC support
- Solaris/NT comm. problems solved (NA45)

JS/DD very skeptical about **GC** strategies

- technical concerns

- **First experiences with NT cluster/Objy**

NA45: CS2 (Solaris) for mass storage, small NT cluster
(7 nodes) to process data

Matthias Messer (NA45) will report in June (?)

And ...

- DD: gmake on NT
 - solves many problems, ease portability
- OpenGL, OpenInventor heavily used
- g++
 - bad reputation?
 - better solutions for Linux exist (commercial)
- Visual C++
 - people like it (as a compiler)
 - still no full support of ANSI features